INDEX TO VOLUME 24

The index covers only the major papers, their authors, and principal headings. It does not include the abstracts. For the latter there is a separate index to authors on pages 159A through 165A. Minutes of business meetings, officers, and reports are entered only under American Society of Zoologists.

Abstracts, see note above.
  Index of authors, annual meeting, Denver, Colorado, 159A–165A.
  Key word index, 166A–170A.
  Of annual meeting, Denver, Colorado, 1A–158A.
ALEXANDER, R. MCNEILL, Elastic energy stores in running vertebrates, 85–94.
ALTERNATIVE REPRODUCTIVE TACTICS, 305–418.
  ARB classification and ESS testing, 309–319.
  Diversity of alternative mating tactics, 333–343.
  Female choice tactics in a scorpionfly, 367–383.
  Genetic variation and sexual selection, 355–366.
  Introduction, 307–308.
  Mating tactics and ESS, 385–396.
  Spider tactics, 321–332.
  Toad reproductive tactics, 407–418.
  Water strider mating strategies, 345–353.
  Young male bullfrog mating behaviors, 397–406.
American Society of Zoologists,
  Committees, 286–287.
  Divisional officers, 286.
  Financial statement, 291–292.
  Minutes of annual business meeting, 288–290.
  Officers for 1984, 286–287.
  Presidents, 285
American Zoologist,
  Directions for authors, cover 1.
  Editorial board, cover 1.
  Statement of ownership, xiv.
  Subscriptions, cover 1.
AUSTAD, STEVEN N., A classification of alternative reproductive behaviors and methods for field-testing ESS models, 309–319.
AUSTAD, STEVEN N. AND RICHARD D. HOWARD, Introduction to the symposium: Alternative reproductive tactics, 307–308.
BALDWIN, KATE METHENY, see HAKIM, RAZIEL SAMUEL.
BALLARD, WILLIAM W., Morphogenetic movements in embryos of the holostean fish, *Amia calva*: A progress report, 539–543.
BELLAIRS, RUTH AND MARIE-CHRISTINE VAN PETEGHEM, Gastrulation: Is it analogous to malignant invasion?, 563–570.
BIOMECHANICS, 1–134.
  Aerodynamics of flapping flight, 95–105.
  Aquatic vertebrate form, locomotion, foraging, 107–120.
  Drag and flexibility, 37–44.
  Elastic energy stores in running, 85–94.
  Flow effects on benthic communities, 45–55.
  Gastropod structure and performance, 23–36.
  How benthic organisms withstand moving water, 57–70.
  Introduction, 3.
  Mechanical properties of bone, 5–12.
  Soft tissue mechanics, 13–22.
  Suspension feeding mechanisms, 71–84.
  Unsteady swimming, 121–134.
Book Review: *Shrimps, lobsters, and crabs of the Atlantic coast of the eastern United States, Maine to Florida*, 989.
BOORD, ROBERT L. AND CATHERINE A. MCCORMICK, Central lateral line and auditory pathways: A phylogenetic perspective, 765–774.
BRADLEY, TIMOTHY J., Mitochondrial placement and function in insect ion-transporting cells, 157–167.
BRICK, IRVING AND CLEMENT WEINBERGER, Introduction to the symposium: Gastrulation, 537–538.
BRICK, IRVING AND CLEMENT WEINBERGER, Electrophoretic properties, cell surface morphology and calcium in amphibian gastrulation, 629–647.
BRICK, IRVING, see WEINBERGER, CLEMENT *et al.*
BULLOCK, THEODORE H., The future of comparative neurology, 693–700.
BURNETT, LOUIS E., CO_2 excretion across isolated perfused crab gills: Facilitation by carbonic anhydrase, 253–264.
CADE, WILLIAM H., Genetic variation underlying sexual behavior and reproduction, 355–366.
Calcification in biological systems, mechanisms of, 835–988.
CELLULAR MECHANISMS OF ION REGULATION IN ARTHROPODS, 135–284.
  Artemia salt gland isolation, 265–274.
  Carbonic anhydrase function in arthropods, 241–251.
  Cell junctions in ion transport systems, 169–175.
  CO_2 excretion in crabs, 253–264.
  Control of salivary secretion in ticks, 217–227.
  Crustacean renal organic anion transport, 275–284.
  Enzymes of insect cell membranes, 187–197.
  Ground substance, 199–215.
  Introduction, 137.
  Ionic permeability of insect epithelia, 229–240.
  Mitochondrial placement and function, 157–167.
  Transport ATPases in arthropods, 177–185.
  Ultrastructure of arthropod epithelia, 139–156.
CHÉTAIL, MONIQUE, see FOURNIÉ, JEAN.
CHRISTENSON, TERRY E., Alternative reproductive tactics in spiders, 321–332.
CIOFFI, MOIRA, Comparative ultrastructure of arthropod transporting epithelia, 139–156.
CRENSHAW, MILES AUBREY, Concluding remarks, 987–988.
CRENSHAW, MILES AUBREY, see GREENFIELD, EDWARD MICHAEL *et al.*
CRUCE, WILLIAM L. R. AND DONALD B. NEWMAN, Evolution of motor systems: The reticulospinal pathways, 733–753.

CURREY, JOHN, Comparative mechanical properties and histology of bone, 5–12.
DANIEL, THOMAS L., Unsteady aspects of aquatic locomotion, 121–134.
DAVIS, GRAYSON S., Migration-directing liquid properties of embryonic amphibian tissues, 649–655.
DENNY, MARK W., Introduction to the symposium: Biomechanics, 3.
DENNY, MARK W., Mechanical properties of pedal mucus and their consequences for gastropod structure and performance, 23–36.
DEMSKI, LEO S., Introduction to the symposium: Evolution of neural systems in vertebrates: Functional-anatomical approaches, 691.
DEMSKI, LEO S., The evolution of neuroanatomical substrates of reproductive behavior: Sex steroid and LHRH-specific pathways including the terminal nerve, 809–830.
DILLAMAN, RICHARD, see ROER, ROBERT.
DOMINEY, WALLACE J., Alternative mating tactics and evolutionarily stable strategies, 385–396.
ELLINGTON, CHARLES P., The aerodynamics of flapping animal flight, 95–105.
ESSENBERG, R. C., see SAUER, JOHN R.
ETTENSOHN, CHARLES A., Primary invagination of the vegetal plate during sea urchin gastrulation, 571–588.
Evolutionary biology, science as a way of knowing, 419–534.
EVOLUTION OF NEURAL SYSTEMS IN VERTEBRATES: FUNCTIONAL-ANATOMICAL APPROACHES, 689–833.
Brain monoaminergic systems, 783–790.
CNS evolution, 701–716.
CNS remodeling in a blind fish, 775–782.
Evolution of octavolateralis pathways, 765–774.
Evolution of thermoregulation, 791–807.
Hormone-specific brain pathways, 809–830.
Introduction, 691.
Perspectives on neural evolution, 831–833.
Reticulospinal pathways, 733–753.
Sensory systems, 717–731.
Systems for homoplasous periphery, 755–763.
The future of comparative neurology, 693–700.
EYSTER, LINDA S. AND M. PATRICIA MORSE, Early shell formation during molluscan embryogenesis, with new studies on the surf clam, *Spisula solidissima*, 871–882.
FAIRCHILD, LINCOLN, Male reproductive tactics in an explosive breeding toad population, 407–418.
FISH, STEPHEN E., see VONEIDA, THEODORE J.
FOURNIÉ, JEAN AND MONIQUE CHÉTAIL, Calcium dynamics in land gastropods, 857–870.
FUNG, Y. C., Structure and stress-strain relationship of soft tissues, 13–22.
GASTRULATION, 535–688.
Amia morphogenetic movements, 539–543.
Amphibian gastrulation, 629–647.
Cell movement in amphibian gastrulation, 615–627.
Early sea urchin gastrulation, 571–588.
ECM in *Xenopus* gastrulation, 605–614.
Fundulus epiboly, 673–688.
Gastrulation and malignant invasion, 563–570.
Ingression during chick gastrulation, 555–562.
Ingression in chick gastrulation, 545–554.
Introduction, 537–538.
Liquidity of embryonic amphibian tissues, 649–655.
Tissue mechanics: Amphibian gastrulation, 657–672.
Xenopus gastrulation, 589–603.
GREENFIELD, EDWARD M., DOUGLAS COURTNEY WILSON, AND MILES AUBREY CRENSHAW, Ionotropic nucleation of calcium carbonate by molluscan matrix, 925–932.
HAKIM, RAZIEL SAMUEL AND KATE METHENY BALDWIN, Cell junctions in arthropod ion-transport systems, 169–175.
HANRAHAN, JOHN W., Ionic permeability of insect epithelia, 229–240.
HART, NATHAN H., Films, filmstrips and videotapes in evolutionary biology, 465–466.
HEATH, JAMES E., see NELSON, DOUGLAS O. *et al.*
HENRY, RAYMOND P., The role of carbonic anhydrase in blood ion and acid-base regulation, 241–251.
HOLLIDAY, CHARLES W. AND DAVID S. MILLER, Cellular mechanisms of organic anion transport in crustacean renal tissue, 275–284.
HOWARD, RICHARD D., Alternative mating behaviors of young male bullfrogs, 397–406.
HOWARD, RICHARD D., see AUSTAD, STEVEN N.
Ion regulation in arthropods, cellular mechanisms of, 135–284.
JOHNSON, KURT E., Glycoconjugate synthesis during gastrulation in *Xenopus laevis*, 605–614.
JUMARS, PETER A. AND ARTHUR R. M. NOWELL, Fluid and sediment dynamic effects on marine benthic community structure, 45–55.
KELLER, R. E., The cellular basis of gastrulation in *Xenopus laevis*: Active, postinvolution convergence and extension by mediolateral interdigitation, 589–603.
KEMP, NORMAN E., Organic matrices and mineral crystallites in vertebrate scales, teeth and skeletons, 965–976.
KINGSLEY, RONI J., Spicule formation in the invertebrates with special reference to the gorgonian *Leptogorgia virgulata*, 883–891.
KOEHL, M. A. R., How do benthic organisms withstand moving water?, 57–70.
KUNIGELIS, S. C., see SALEUDDIN, A. S. M.
LABARBERA, MICHAEL, Feeding currents and particle capture mechanisms in suspension feeding animals, 71–84.
LEVIN, BRUCE R., Science as a way of knowing—Molecular evolution, 451–464.
LOWY, R. JOEL, Isolation of salt glands from the larval brine shrimp *Artemia salina*, 265–275.
MAYER, WILLIAM V., The arrogance of ignorance—Ignoring the ubiquitous, 423–431.
MECHANISMS OF CALCIFICATION IN BIOLOGICAL SYSTEMS, 835–988.
Artemate brachiopod shell, 977–985.
Basal plate of elasmoid scales, 953–964.
Calcification in crustacean cuticle, 893–909.
Calcium dynamics in land gastropods, 857–870.
Concluding remarks, 987–988.
Ionotropic nucleation in molluscs, 925–932.
Introduction, 837.

Mineral crystallites in vertebrates, 965–976.
Mineralization window, 847–856.
Minerals, phyla and research, 839–845.
Molluscan early shell formation, 871–882.
Neuroendocrine control of shell formation, 911–916.
Organization of organic matrix, 945–951.
Regulation by calcium carbonate matrix, 933–944.
Spicule formation in invertebrates, 883–891.
Thyroxine effects on *Aurelia* statoliths, 917–923.
MEUNIER, FRANÇOIS J., Spatial organization and mineralization of the basal plate of elasmoid scales in osteichthyans, 953–964.
MCCORMICK, CATHERINE, see BOORD, ROBERT L.
MILLER, DAVID S., see HOLLIDAY, CHARLES W.
MOORE, JOHN A., Science as a way of knowing—Evolutionary biology, 467–534.
MOORE, JOHN A., Science as a way of knowing—Evolutionary biology: Opening remarks, 421–422.
MORSE, M. PATRICIA, see EYSTER, LINDA S.
NAKATSUJI, NORIO, Cell locomotion and contact guidance in amphibian gastrulation, 615–627.
NELSON, DOUGLAS O., JAMES E. HEATH, AND C. LADD PROSSER, Evolution of temperature regulatory mechanisms, 791–807.
Neural systems in vertebrates: Functional-anatomical approaches, evolution of, 689–833.
NEWMAN, DONALD B., see CRUCE, WILLIAM L. R.
NORTHCUTT, R. GLENN, Evolution of the vertebrate central nervous system: Patterns and processes, 701–716.
NOWELL, ARTHUR R. M., see JUMARS, PETER A.
OSCHMAN, JAMES L., Structure and properties of ground substances, 199–215.
PAN, CHI-MIAU, see WATABE, NORIMITSU.
PARENT, ANDRÉ, Functional anatomy and evolution of monoaminergic systems, 783–790.
Past-Presidential Address, 293–304.
PENNER, PHILIP L., see WEINBERGER, CLEMENT *et al.*
PHILLIPS, HERBERT M., Physical analysis of tissue mechanics in amphibian gastrulation, 657–672.
PROSSER, C. LADD, see NELSON, DOUGLAS O. *et al.*
Reproductive tactics, alternative, 305–418.
ROER, ROBERT AND RICHARD DILLAMAN, The structure and calcification of the crustacean cuticle, 893–909.
RUBENSTEIN, DANIEL I., Resource acquisition and alternative mating strategies in water striders, 345–353.
SALEUDDIN, A. S. M. AND S. C. KUNIGELIS, Neuroendocrine control mechanisms in shell formation, 911–916.
SAUER, JOHN R. AND R. C. ESSENBERG, Role of cyclic nucleotides and calcium in controlling tick salivary gland function, 217–227.
SCIENCE AS A WAY OF KNOWING—EVOLUTIONARY BIOLOGY, 419–534.
Evolution: The biology of whole organisms, 443–450.
Evolutionary biology, 473–534.
Films, filmstrips and videotapes in evolutionary biology, 465–466.
Introduction, 421–422.
Molecular evolution, 451–464.
Science as a way of knowing, 467–472.
The arrogance of ignorance, 423–431.
The shame of science education, 443–441.
SIKES, STEVEN, see WHEELER, ALFRED P.
SIMKISS, KENNETH, The karyotic mineralization window (KMW), 847–856.
SPANGENBERG, DOROTHY BRESLIN, Effects of exogenous thyroxine on statolith synthesis and resorption in *Aurelia*, 917–923.
THORNHILL, RANDY, Alternative female choice tactics in the scorpionfly *Hylobittacus apicalis* (Mecoptera) and their implications, 367–383.
TOWLE, DAVID W., Introduction to the symposium: Cellular mechanisms of ion regulation in arthropods, 137.
TOWLE, DAVID W., Membrane-bound ATPases in arthropod ion-transporting tissues, 177–185.
TRINKAUS, J. P., Mechanism of *Fundulus* epiboly—A current view, 673–688.
ULINSKI, PHILIP S., Design features in vertebrate sensory systems, 717–731.
VAKAET, LUCIEN, The initiation of gastrular ingression in the chick blastoderm, 555–562.
VAN PETEGHEM, MARIE-CHRISTINE, see BELLAIRS, RUTH.
VERNBERG, F. JOHN, Fiddler crabs: Ecosystems–Organisms–Molecules, 293–304.
VOGEL, STEVEN, Drag and flexibility in sessile organisms, 37–44.
VOLPE, E. PETER, The shame of science education, 433–441.
VONEIDA, THEODORE J. AND STEPHEN E. FISH, Central nervous system changes related to the reduction of visual input in a naturally blind fish (*Astyanax hubbsi*), 775–782.
WAKE, MARVALEE H., Science as a way of knowing—Evolution: The biology of whole organisms, 443–450.
WALTZ, EDWARD C. AND LARRY L. WOLF, By Jove! Why do alternative mating tactics assume so many different forms? 333–343.
WATABE, NORIMITSU, Introduction to the symposium: Mechanisms of calcification in biological systems, 837.
WATABE, NORIMITSU AND CHI-MIAU PAN, Phosphatic shell formation in atremate brachiopods, 977–985.
WEBB, P. W., Body form, locomotion and foraging in aquatic vertebrates,107–120.
WEBSTER, DOUGLAS B., Perspectives on the evolution of neural systems, 831–833.
WEINBERGER, CLEMENT, see BRICK, IRVING.
WEINBERGER, CLEMENT, see BRICK, IRVING (Introduction).
WEINBERGER, CLEMENT, PHILIP L. PENNER, AND IRVING BRICK, Polyingression, an important morphogenetic movement in chick gastrulation, 545–554.
WEINER, STEPHEN, Organization of organic matrix components in mineralized tissues, 945–951.
WHEELER, ALFRED P. AND C. STEVEN SIKES, Regulation of carbonate calcification by organic matrix, 933–944.
WILBUR, KARL M., Many minerals, several phyla, and a few considerations, 839–845.

WILCZYNSKI, WALTER, Central neural systems subserving a homoplasous periphery, 755–763.
WILSON, DOUGLAS COURTNEY, see GREENFIELD, EDWARD MICHAEL *et al.*
WOLF, LARRY L., see WALTZ, EDWARD C.
WOLFERSBERGER, MICHAEL G., Enzymology of plasma membranes of insect intestinal cells, 187–197.